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(54) **Transpiring shoe structure**

(57) A transpiring shoe structure comprising an upper (9), a sole (3) provided with a plurality of through holes (5) across its thickness and a water-repellent and transpiring insole (7) attached above said sole (3) or a bag upper (99, 999) again with an insole (77, 777) formed by a water-repellent and transpiring membrane again attached above said perforated sole (33, 333).

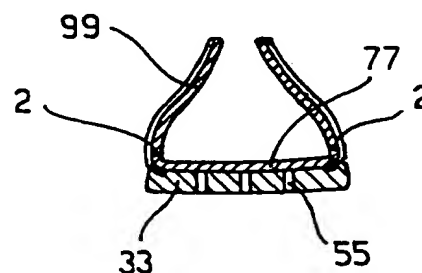


FIG. 2b

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Description

[0001] The present invention relates to a structure of a transpiring shoe for allowing the exchange of air stagnating inside the shoe through a perforated sole in order to achieve perfect transpiration of the foot.

[0002] For some time footwear has been known which ensures transpiration of the foot through the effect of one or more openings, in the form for example of one or more series of holes provided on the upper or, alternatively, directly on the sole of the shoe.

[0003] The solution of forming openings on the upper is not lacking in serious disadvantages, above all the fact that the exchange of air mainly involves the area of the shoe at the instep. The sole, which is obviously the part of the foot most subject to perspiration, therefore only benefits marginally from the effects of the air exchange.

[0004] The proposed solution of forming the openings directly on the sole has enabled most of the restriction described above to be avoided, but has entailed an increase in the complexity of the structure of the sole.

[0005] More particularly, in order to enable transpiration of the foot, a structure of a sole has been proposed which is the result of the assembly of a perforated tread with a transpiring arch-support, with a membrane which is selectively permeable to air but not to water placed in between.

[0006] This solution, in addition to complicating the standard procedure of manufacture of the footwear, may make the mechanism for expulsion of air towards the outside environment of little effect, most of the air to be expelled having to tackle a somewhat winding path before being able to be released externally.

[0007] The object of the present invention is therefore that of providing a transpiring shoe which remedies all the disadvantages previously referred and complained of in traditional embodiments, and more particularly which is made without modifying the standard procedure of manufacturing the shoe itself.

[0008] Another object of the present invention is that of providing a transpiring shoe without altering the line or appearance or area of intended use thereof.

[0009] Yet another object of the present invention is that of providing a simple system for transpiration so as not to affect or affect slightly the cost of the end product.

[0010] In order to achieve all these objects simultaneously, the present invention provides transpiring footwear which complies with the features of the claims attached hereinbelow.

[0011] The footwear of the present invention is characterised by the possibility of allowing transpiration of the foot simply by applying to the internal surface of the perforated tread or sole an insole in a material which is impermeable to water but transpiring. In this way a more efficient mechanism of ventilation of the shoe is guaranteed, given that the simple transpiring sole structure designed in this way encourages a virtually direct

exchange of air between the interior of the shoe and the external environment.

[0012] The process of manufacturing the transpiring shoe of the present invention is virtually unchanged in relation to the normal process of fabrication of a shoe, given that it can be obtained from the waterproofed peripheral attachment between the perforated sole and an insole in a material which is selectively permeable to air but not to water, the latter insole being also integrated with an upper in a bag construction of the tubular or of the Stroberg™ or California™ type, or from the waterproofed peripheral attachment between the aforementioned insole and the sole whereon the upper is subsequently mounted.

[0013] The present invention will be described in greater detail and illustrated according to the various preferred embodiments which refer to the accompanying drawings, in which:

Figs. 1a, 1b and 1c schematically show a side view and a front view, sectioned, of the transpiring shoe of the present invention according to a preferred embodiment, and a plan view of a detail of the shoe comprising the perforated sole and the insole, impermeable to water but not to air.

Figs. 2a and 2b schematically show a side view and a front view, sectioned, of the transpiring shoe of the present invention according to another preferred embodiment manufactured with the use of a Stroberg™ or California™ bag upper.

Figs. 3a and 3b schematically show a side view and a front view, sectioned, of the transpiring shoe of the present invention according to another preferred embodiment which uses a tubular bag upper.

[0014] In Figs. 1a, 1b and 1c a first embodiment is shown of the present invention wherein the shoe 1 comprises a tread or sole 3 provided with vertical through holes 5 which open on the upper surface of the same sole 3.

[0015] The through holes 5 form on the upper surface of the sole 3 a grid which is entirely covered by an insole 7 in a material which is selectively permeable to air but not to water, for example in Goretex™.

[0016] The insole 7 is attached peripherally to the sole 3 in such a position that the area of attachment (shown in heavy print in Fig. 1b) between the sole 3 and the insole 7 totally circumscribes the grid of holes 5.

[0017] In this way the water which, from the ground, rises from the holes 5, cannot penetrate the interior of the footwear 1.

[0018] Natural attachment of the insole 7 to the sole 3 must be watertight, and in the present case is achieved by gluing. Other equally effective systems, such as waterproofed stitching, sealing or injection can also be foreseen. It is also possible to replace the Gore-

tex™ with another material having the same features.

[0019] The construction of the shoe 1 is completed by attaching peripherally the upper 9 on the external edge of the sole 3.

[0020] In Figs. 2a and 2b the shoe structure 11 is formed by a sole 33 provided with through holes 55, and an insole 77 in a material which is impermeable to water but transpiring, integrated with an upper 99 with a Stroberg™ or California™ bag construction.

[0021] In this type of construction the insole 77 is already sewn on the lower edge of the upper 99 when it is glued to the perforated sole 33.

[0022] The stitching 2 of the insole 77 on the upper 99 is not forced to be waterproofed given that gluing in a more internal position (shown in heavy print in Fig. 2b) between the insole 77 and the sole 33 is sufficient for avoiding any undesirable infiltration of water inside the shoe 11.

[0023] Obviously, as in the previous preferred embodiment, in this embodiment too the peripheral attachment between sole 33 and insole 77 can take place by any other technique mentioned above which allows perfect watertightness.

[0024] Furthermore, in this shoe structure, easy positioning of the insole 77 on the holes 55 of the tread 33 is achieved given that now, in order to guide the insole 77 on the holes 55 into the correct position, it is possible to move the entire upper-insole assembly which tends to adapt spontaneously to the shape of the sole 33.

[0025] A shoe structure of another preferred embodiment of the present invention is shown in Figs. 3a and 3b wherein, on the sole 333 provided with holes 555, an upper 999 is attached with a tubular bag construction in a material which is impermeable to water but not to air. From the external edge of the sole 333 a band 444 extends upwards, to whose internal side wall the upper 999 is attached, in this specific case glued but in general attached with one of the methods mentioned above which ensure watertightness.

[0026] In the tubular bag construction the base portion 777 which is superimposed on the holes 555 represents the insole which prevents the passage of water towards the interior of the footwear.

[0027] With this construction the operation of sewing between the upper and insole of the shoe structure illustrated in Figs. 2a and 2b is avoided.

[0028] Moreover gluing of the insole 777, not on the actual perforated sole but on the band 444, generates between the insole 777 and the sole 333 a large interspace of moist air to be expelled which is compressed by the foot during walking and consequently conveyed towards the inlet of the holes 555. In this way the expelled air is preferably the air present below the foot which is notoriously that which is most full of perspiration and moisture.

[0029] It could however be foreseen to implement the aforesaid band also on the structures of shoes of the embodiments of Figs. 1a-1c and of Figs. 2a-b. In the

particular case of a transpiring shoe structure in accordance with the present invention which uses a Stroberg™ or California™ bag construction, the stitching between the upper and insole, if internal in relation to the point of attachment between the bag and the band, must naturally be made impermeable.

[0030] Vice versa it can also be foreseen to provide a transpiring shoe structure in accordance with the present invention wherein the tubular bag structure is attached to a perforated sole without band, with waterproofed peripheral attachment between the insole and sole.

[0031] As has been seen therefore, the present invention provides a shoe structure, comprising a perforated sole wherein an insole is attached in a material which is selectively permeable to air but not to water and an upper which can already be integrated with the insole according to a bag construction of the tubular or Stroberg™ or California™ type, or which alternatively is attached directly to the sole, said shoe structure being suitable for transpiration of the foot even if made without modifying or complicating the normal procedure of manufacture of a shoe.

[0032] It is understood that what is given as an example in the present preferred embodiments must not limit in any way the wider concept claimed.

[0033] More particularly it can also be foreseen for the transpiring footwear to have a perforated sole wherein the number, distance and arrangement of the holes can vary as required.

[0034] The distribution of the holes can involve the whole sole, or only one of its portions, for example a portion corresponding to the heel or to the sole of the foot.

Claims

1. A shoe structure comprising an upper and a sole provided with a plurality of through holes across its thickness, characterised in that it also comprises a water-repellent and transpiring insole (7, 77, 777) positioned above said sole (3, 33, 333).
2. A shoe structure according to claim 1, characterised in that said impermeable and transpiring insole (7, 77, 777) positioned above said sole (3, 33, 333) is attached peripherally above said sole (3, 33, 333) in such a position that the area of attachment between said sole (3, 33, 333) and said insole (7, 77, 777) circumscribes said plurality of holes (5, 55, 555).
3. A shoe structure for transpiration according to the previous claim, characterised in that said sole (3, 33, 333) and said water-repellent and transpiring insole (7, 77, 777) are attached one to the other by means of known systems chosen from among waterproofed stitching, sealing, gluing or injection.

4. A transpiring shoe structure according to claims 2 and 3, characterised in that said upper (999) is of a tubular bag type and is made of a material which is selectively permeable to air but not to water, said insole (777) being formed by the base portion of said tubular bag upper (999) which is attached above said sole (333). 5
5. A transpiring shoe structure according to claims 2 and 3, characterised in that said upper (99) is a Stroberg™ or California™ bag type upper and has the base portion made of a material selectively permeable to air but not to water, said base portion defining said insole (77) which is joined by stitching to the lower edge of the remaining part of said upper (99) in such a way as to position said stitching (2) outside of said area of attachment between said insole (77) and said sole (33). 10 15
6. A transpiring shoe structure according to claim 1, characterised in that from the edge of the sole (333), and integrally therewith, a band (444) extends upwards, on whose internal side wall said insole (777) is attached by means of any known technique chosen from among gluing, sealing, injection or waterproofed stitching. 20 25

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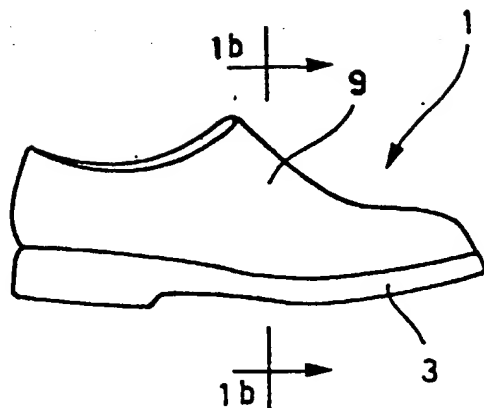


FIG. 1a

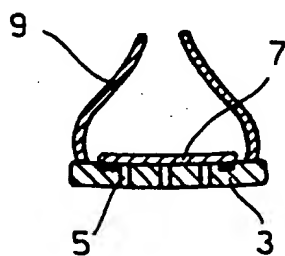


FIG. 1b

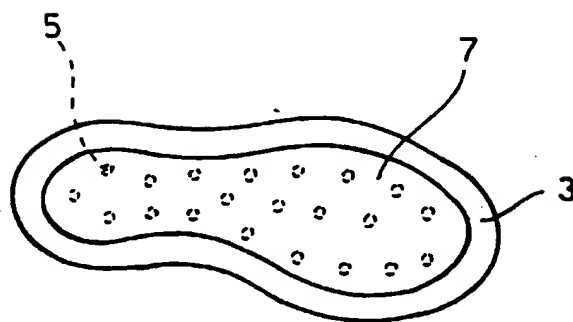
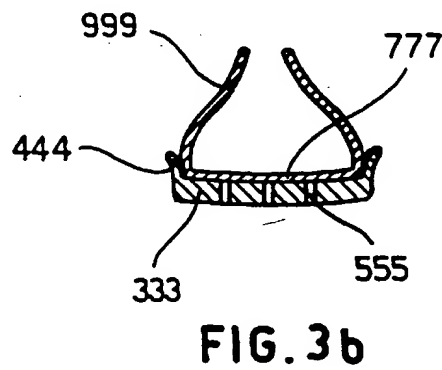
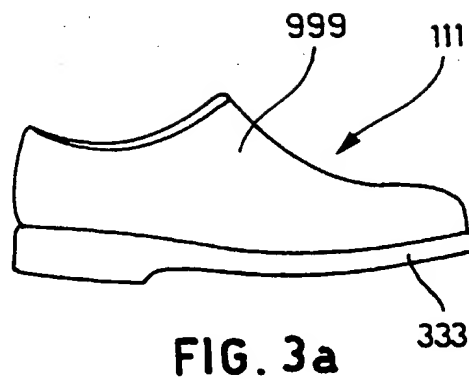
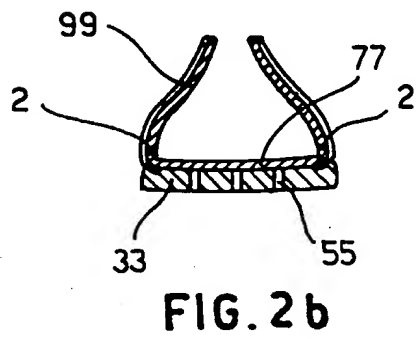
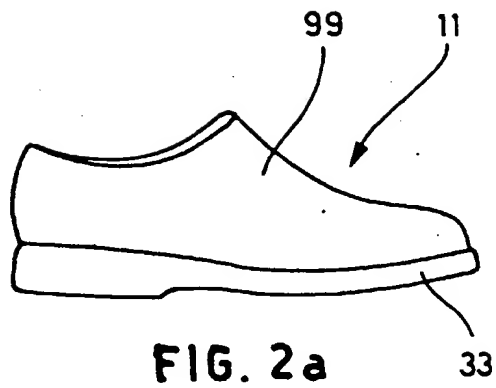


FIG. 1c





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 99 10 2897

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	EP 0 275 644 A (JAPAN GORE TEX INC) 27 July 1988 (1988-07-27) * the whole document *	1-5	A43B7/08 A43B7/12
X	WO 97 14326 A (POLEGATO MARIO ;NOTTINGTON HOLDING B V (NL)) 24 April 1997 (1997-04-24) * page 6, line 25 - page 7, line 25 * * figure 3 *	1-3,6	
A	FR 2 681 514 A (PHILIPPE CHRISTIAN) 26 March 1993 (1993-03-26) * page 7, line 9 - line 12 * * figure 2 *	5	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27 December 1999	Examiner van Elk, M
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EP 99 10 2897

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